

Sampling Microbiological Aerosols

ANALYSIS of biological forms in the atmosphere has not, until recently, enjoyed the attention given to the study of chemical, inert, and radioactive pollutants. However, the emergence of antibiotic resistant staphylococcal strains in hospitals, the high prevalence of minor respiratory illness revealed by the U.S. National Health Survey, and the potentialities of biological warfare have stimulated attention to the processes of airborne infection and the use of instruments to detect, identify, and assess biological contamination of the air. In particular, instrument methods are sought to sample the flora of the atmosphere.

This monograph acquaints personnel in hospitals and government and private research laboratories and other interested persons with the principles and problems of sampling airborne micro-organisms and with the numerous devices that can be used for a variety of air-sampling conditions. It serves as an aid to those establishing and conducting a biological air-sampling program by supplying information concerning bacterial air-sampling methods, particle sizing, selection of samplers, operational methods, and descriptions and characteristics of many different biological air samplers.

The basic methods of aerosol sampling are: impingement in liquids, impaction on solid surfaces, filtration, sedimentation, centrifugation, electrostatic precipitation, and thermal precipitation. Samplers based on all of these methods have been developed and are described in the monograph.

When selecting a sampler for a specific sampling program one must first have a clear understanding of the type of information that is desired and the particular determinations that must be made. For example, in the studies of airborne micro-organisms and their relation to respiratory infections, information is required concerning the size of the sampled particles. This can be obtained by use of impac-

tion-type samplers, which contain a series of stages through which air passes at different velocities.

For other studies it may be desirable to determine how the airborne microbiological content varies with time. This also can be accomplished with impaction-type samplers if the impacting surface is moved in such a way that the location of the aerosol particles on the collecting surfaces indicates the time that the particles were collected.

No one type of sampler can provide the answers required for all sampling problems. It is because of this consideration that so many different types of aerosol samplers have been de-

Public Health Monograph No. 60

Sampling Microbiological Aerosols. By *Harold W. Wolf, Peter Skaliy, Lawrence B. Hall, Marvin M. Harris, Herbert M. Decker, Lee M. Buchanan, and Charles M. Dahlgren.* Public Health Monograph No. 60 (PHS Pub. No. 686), 53 pages, illustrated. U.S. Government Printing Office, Washington, D.C., 1959, 45 cents.

The accompanying summary covers the principal contents of Public Health Monograph No. 60, published concurrently with this issue of *Public Health Reports*. This monograph is the joint work of members of the Technical Development Laboratories, Communicable Disease Center, Public Health Service, and the U.S. Army Chemical Corps, Fort Detrick, Md.

For readers wishing the data in full, copies are on sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. Official agencies and others directly concerned may obtain single sample copies without charge from the Public Inquiries Branch, Office of Information, Public Health Service. Copies will be found also in the libraries of professional schools and the major universities and in selected public libraries.

veloped. To help the investigator select the type most adaptable to his particular problem, a table lists the samplers according to the basic methods of aerosol sampling and gives operating characteristics and limitations of each type.

A section devoted to operational methods discusses the control and measurement of air-sampling rates, sterilization of samplers, formulations of bacteriological media and collecting fluids, and processing of samples. It contains formulas for computation of sampling data.

Another section contains suggestions for consideration when planning a sampling program. Since selection of a proper sampler is also de-

pendent upon the expected concentration that must be sampled, information is provided on the normal bacterial levels found in an industrialized urban area and in a rural area. Bacterial levels created by various activities inside several buildings are also presented.

The final chapter illustrates 37 different biological samplers. Accompanying each illustration is a detailed description of the sampler, including operating information. References relating to the use of the sampler and the commercial source are listed. If the sampler is not commercially available, a source is given where engineering drawings can be obtained.

International Conference on Mental Retardation

A pioneer worldwide medical conference for the purpose of bringing into sharper focus and evaluating causes of mental retardation was held in Portland, Maine, July 27-31, 1959. More than 600 conferees representing 40 States in this country and 33 foreign lands attended the sessions.

Underscoring the need for continuing research in mental deficiency, the First International Medical Conference on Mental Retardation set up a permanent organization for concerted work. A permanent committee was organized of physicians from Wales, Germany, Austria, Sweden, Denmark, Italy, Poland, France, Argentina, and the United States. Dr. K. Kundratitz of Vienna, Austria, was named chairman. That city was selected for the 1961 conference.

Featuring 35 speakers, the program included reports on pathological findings in the brain of mentally retarded patients; malformations produced in animals by abnormal food, poisons, or other types of damage; inborn metabolic errors explained by abnormalities in the enzyme function; experiments

in autonomic regulation in the brain; pathological findings in birth trauma and asphyxia; differences of metabolism and oxygen utilization in animals before and after birth; sequels of infectious diseases of the central nervous system in respect to mental development; metabolism of the amino acids and the diseases now considered related to abnormalities in amino acid metabolism; the metabolism of copper, iron, and lead and related diseases with mental deterioration; and recent findings of chromosomal abnormalities in mentally retarded persons.

Conference exhibits included aspects of phenylketonuria; a simple method for the detection of amino-aciduria; rare types of mental deficiency; toxoplasmosis; and ataractics in the treatment of mentally retarded children.

The conference recommended that all governments of the world set aside sufficient funds for furthering knowledge of mental retardation, as well as its medical treatment and social and educational needs.

Proceedings of the conference will be available in published form in the spring of 1960.

Federal Publications

Proceedings of the 1959 Annual Conference of the Surgeon General, Public Health Service, With State and Territorial Mental Health Authorities. *PHS Publication No. 705; 1959; 36 pages.*

Addresses and actions of the annual conference of the Surgeon General with mental health authorities are reported. This is his first conference with this group at a time different from the meeting with State and Territorial health officers.

Recommendations pertain to the use of Hill-Burton funds for joint interstate facilities, an ad hoc committee to work with the Service in formulating treatment and administrative guidelines for statewide plans for mental health facilities, study of patient-care costs, training and research programs, matching requirements for community mental health grants, additional grant aid where needed, amendment of social security laws relating to mental health patients, projects in research applications, aftercare programs and services, and vocational rehabilitation.

Health Statistics From the U.S. National Health Survey. Limitation of activity and mobility due to chronic conditions, United States, July 1957-June 1958. *PHS Publication No. 584-B11; 1959; 40 pages; 30 cents.*

Activity limitation data in this report refer to persons reported in household interviews as being unable to carry on their major activities of working, keeping house, or going to school; limited in amount or kind of major activity; or not curtailed in major activity but otherwise restricted. Mobility limitation data describe persons having difficulty getting around alone, unable to get around alone, or confined to the house. Twenty tables show numbers and percentage distributions by major activity, family income, sex and age, sex and urban-rural resi-

dence, and age and urban-rural residence.

The appendixes carry technical notes on methods, definitions of terms, and a reproduction of the questionnaire on which the information was elicited.

Sanitary Engineering Manpower. *PHS Publication No. 703; 1959; by Frank A. Butrico and Israel Light; 32 pages; 25 cents.*

An attempt to assess the strength of the sanitary engineering specialty, this booklet presents a composite picture of almost two-thirds of the total estimated sanitary engineers in the country. It gives the age, education, professional experience, years of service, kind of work and type of employer, income, and related characteristics of approximately 4,000 such engineers.

The original data were gathered in cooperation with the National Science Foundation's Scientific and Engineering Manpower Unit.

Bibliography on Cancer for Nurses. *PHS Publication No. 687 (Public Health Bibliography Series No. 26); 1959; by Patricia B. Geiser; 38 pages; 20 cents.*

Four hundred and fifty-one selected references and thirty-seven films are listed to help nurses and nursing students locate source material from nursing and other related fields. References from professional journals and the films are annotated.

A list of companies that manufacture prosthetic devices and equipment used in the care of patients with cancer is also provided.

Methods of Making Sanitation Ratings of Milk Sheds. *PHS Publication No. 678; 1959; 19 pages; 15 cents.*

Procedures for evaluating community milk supplies are presented to help State milk control authorities measure objectively the extent to which communities adopting the

Milk Ordinance and Code recommended by the Public Health Service are enforcing its provisions. Figures are included to show how data collected are tabulated and the numerical rating calculated.

This booklet can also be used as a guide for rating interstate milk supplies under the cooperative State-*PHS* voluntary program.

Examinations for Cervical Cancer. *PHS Publication No. 707; 1959; leaflet.* Intended for private practitioners and physicians attending beneficiaries of governmental medical care. Briefly describes digital and visual examinations, Papanicolaou smear, and Schiller test and biopsy. Outlines steps in prevention and control of cervical cancer. Depicts advantages of early diagnosis.

Facts on Blindness in the United States. *PHS Publication No. 706; 1959; 6 pages; single copies 5 cents, \$2.50 per 100.*

Written for the general public, this leaflet is intended for use by health departments and community groups in promoting information programs and glaucoma casefinding activities.

It identifies the 10 leading causes of blindness and emphasizes the importance of periodic physical examinations in preventing unnecessary loss of sight. Text and tables present basic information on incidence and prevalence of blindness and the cost of financial aid to the blind.

This section carries announcements of new publications prepared by the Public Health Service and of selected publications prepared with Federal support.

Unless otherwise indicated, publications for which prices are quoted are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. Orders should be accompanied by cash, check, or money order and should fully identify the publication. Public Health Service publications which do not carry price quotations, as well as single sample copies of those for which prices are shown, can be obtained without charge from the Public Inquiries Branch, Office of Information, Public Health Service, Washington 25, D.C.

The Public Health Service does not supply publications other than its own.
